SLOVENSKI STANDARD
SIST EN 17003:2022

01-januar-2022

Cestna vozila - Valjasti preskuševalniki zavor za vozila z nosilnostjo nad 3,5 t - Varnostne zahteve

Road vehicles - Roller brake testers for vehicles of more than 3,5 tons GVW - Safety requirements

Straßenfahrzeuge - Rollen-Bremsprüfstände für Fahrzeuge mit zulässigem Gesamtgewicht größer als 3,5 Tonnen - Sicherheitsanforderungen

Véhicules routiers - Freinomètres à rouleaux pour véhicules supérieurs à 3,5 t - Exigences de sécurité

Ta slovenski standard je istoveten z: **EN 17003:2021**

ICS:

43.180	Diagnostična, vzdrževalna in preskusna oprema	Diagnostic, maintenance and test equipment

SIST EN 17003:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17003

November 2021

ICS 43.180

English Version

Road vehicles - Roller brake testers for vehicles of more than 3,5 tons GVW - Safety requirements

Véhicules routiers - Freinomètres à rouleaux pour véhicules supérieurs à 3,5 t - Exigences de sécurité

Straßenfahrzeuge - Rollen-Bremsprüfstände für Fahrzeuge mit zulässigem Gesamtgewicht größer als 3,5 Tonnen - Sicherheitsanforderungen

This European Standard was approved by CEN on 13 September 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (EN 17003:2021) has been prepared by Technical Committee CEN/TC 301 “Road vehicles”, and its working group WG11, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2022, and conflicting national standards shall be withdrawn at the latest by May 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type-C standard as stated in EN ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved by means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document. In addition, machinery should comply as appropriate with EN ISO 12100:2010 for hazards which are not covered by this document.

When provisions of this type-C standard are different from those which are stated in type-A or -B standards, the provisions of this type-C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type-C standard.

The objective of this document is to define rules for safeguarding persons against the risk of accidents associated with the operation of roller brake testers.

While elaborating this document, it was assumed that only authorized persons operate the roller brake testers.

1 Scope

This document applies to roller brake testers (brake test benches) that are designed for roadworthiness tests on categories M_2, M_3, N_2, N_3, O_3 and O_4 vehicles (as defined in Regulation (EU) 2018/858) and that might be also used to test M_1, N_1 categories.

This document covers fixed-bed roller brake testers with or without inspection pits and whose chassis are inside or outside the building.

This document does not cover mobile roller or plate brake testers.

These roller brake testers are used to take measurements for testing and assessing the efficiencies of the brake systems fitted to vehicles in the above-cited vehicle categories.

The users of the roller brake tester are all kinds of staff that for any reason operate the roller brake testers (e.g. staff working in public transport, vehicle rental, vehicle maintenance, vehicle repair, training, test laboratories and vehicle inspection sectors …). This document is not applicable to roller brake testers manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 614-1:2006+A1:2009, *Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles*

EN 614-2:2000+A1:2008, *Safety of machinery - Ergonomic design principles - Part 2: Interactions between the design of machinery and work tasks*

EN 12464-1:2021, *Light and lighting - Lighting of work places - Part 1: Indoor work places*

EN 60204-1:2018, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016)*

EN 61000-6-2:2005, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005)*

EN 61000-6-3:2007,[1] *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:2006)*

EN 61496-1:2013, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:2012)*

EN 61496-2:2013, *Safety of machinery - Electro-sensitive protective equipment - Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs) (IEC 61496-2:2013)*

EN ISO 4871:2009, *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

[1] As impacted by EN 61000-6-3:2007/A1:2011.

EN ISO 11201:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11688-1:2009, *Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13850:2015, *Safety of machinery - Emergency stop function - Principles for design (ISO 13850:2015)*

EN ISO 14120:2015, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

EN ISO 14122-2:2016, *Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways (ISO 14122-2:2016)*

3 Terms and definitions

For the purposes of this document the terms and definitions given in EN ISO 12100:2010 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
roller brake tester
roller brake test bench
system utilised to produce brake force measurements for testing and assessing the efficiencies of vehicle braking systems

3.2
brake tester
term that, in this document, refers to roller brake tester (or brake test bench)

3.3
chassis
term that, in this document, refers to embedded or mounted mechanical floor units comprising the measuring rollers, drive and gearbox motors, and measuring devices, and that support the wheel or axle under test

3.4
fixed-bed control console
console that features as a minimum the human-machine interface: display, control devices, data storage

3.5
remote control
remote control which is used to navigate and control the human-machine interface at a distance

3.6
electrical box
box which provides the interface between the control console and the chassis, which may be integrated into the fixed-bed control console and which comprises at least:

— the main switch;

— the motor control devices;

— electrical safety components

3.7
wheel presence sensor
term used for a sensor whose function is to provide guaranteed confirmation that a wheel is detected as being safely located in the rollers, in compliance with the required test conditions

Note 1 to entry: The axle weight measurement can be used to confirm the reading or to detect a failure of the presence detection device.

3.8
inspection pit
cavity excavated into the floor, in which a technician stands to inspect the underside of a vehicle

Note 1 to entry: Brake testers do not require an inspection pit in order to operate.

Note 2 to entry: When an inspection pit is required the brake tester roller bed is split and a set of rollers are installed on either side of the pit's cavity.

3.9
active opto-electronic protective device
AOPD
device whose sensing function is performed by optoelectronic emitting and receiving elements detecting the interruption of optical radiation, generated within the device, by an opaque object present in the specified detection zone

[SOURCE: EN ISO 12100:2010]

3.10
light curtain
AOPD comprising an integrated assembly of one or more emitting element(s) and one or more receiving element(s) forming a detection zone with a detection capability specified by the supplier

Note 1 to entry: A light curtain with a large detection capability is sometimes referred to as a light grid.

[SOURCE: EN 61496-2:2013, 3.205]

3.11
trapping zone
area or zone at the interface between a road wheel of the axle under test and the brake tester rollers, which are spinning in the opposite direction towards the nip

Note 1 to entry: The trapping zone creates a draw-in and crushing hazard (see the Informative Annex A).

Note 2 to entry: The trapping zone is sometimes called angle or re-entrant point.

Note 3 to entry: The trapping zone shall be measured from the rotating axis of the rollers.

3.12
operator
person performing test sequences

3.13
driver
person who drives the vehicle during the test sequences who may be also the operator

3.14
hazard zone
danger zone
space within and/or around machinery in which a person can be exposed to a hazard

Note 1 to entry: A list of significant hazards can be found in Annex F.

[SOURCE: EN ISO 12100:2010, 3.11]

3.15
no-trespassing area
area with permanent fully marked surface (yellow and black) on the ground, and where access is prohibited during vehicle test

4 Safety requirements for the roller brake testers and/or protective/risk reduction measures

4.1 General requirements

4.1.1 General

The machinery shall comply with the requirements and/or preventive measures of this clause.

In addition, the machinery shall be designed according to the principles of EN ISO 12100:2010 for relevant but non-significant hazards which are not dealt with by this document.

4.1.2 General features for safety devices

Safety devices necessary for the safe functioning of the roller brake tester shall be considered part of the machinery itself. In some cases, as the correct functioning of safety devices can depend on specific installation conditions, the characteristic of such devices shall be evaluated according to the specificity of the installation.

All safety devices controlling the start-up and/or emergency-stop of the motors (Stop Category 0 or Category 1 under EN 60204-1:2018) shall deliver performance level according to Table 1 (see 4.5).

If safety devices are not able to eliminate every risk completely, then residual risks shall be described and adequately addressed in the user manual.

4.1.3 Prevention from intrusion or contact with moving parts

Safety devices shall ensure that any risk of intrusion in a trapping zone and/or contact with moving parts (from brake tester and vehicle moving parts, such as drive shaft that is rotated, by the roller brake tester) is reduced to the lowest possible level.

When machinery runs, in the case of a chassis fitted over an inspection pit, the safety devices shall prevent or detect access to the area below the floor level close to the bench to prevent contact with the moving parts of the machinery and the vehicle under test.

4.1.4 Re-engagement after a stop

If a safety device stops the brake tester running, the system shall only be re-engaged by a deliberate action from the operator via a control device of the roller brake tester. The automatic restart of the system after a stop caused by a safety device shall not be possible under any circumstances.

Safety devices shall be designed in a way to authorize the test bench motor start and control the stop, taking into account the possibility of stops by unintended response of the safety device (e.g. by dust, snow or smoke, by slight movements of the vehicle, by sensor cables, loss of electrical power).

4.1.5 Safety during maintenance

The option of operating the machinery without the vehicle and with the safety devices disabled shall be only foreseen for maintenance and calibration operations, with dedicated procedures carried out only by trained personnel, as foreseen in 4.3.3.4 and 4.3.3.5.

4.2 Protection around chassis zone

4.2.1 Protection against hazard arising from moving parts

The chassis of the brake tester shall be designed to make impossible the access to the internal moving parts (drive chains, gears) except by authorized personnel using dedicated tools.

The fixed guards shall be designed according to EN ISO 14120:2015.

4.2.2 Axle presence detection

Each side of the roller brake tester shall be fitted with a wheel presence sensor. The 2-wheel presence sensors shall be both activated to allow the bench to start.

The axle presence detection device shall prohibit the roller brake tester to start when no axle is detected and shall interrupt roller brake tester rollers and operation if axle presence detection is lost.

If the roller brake tester is equipped with weight measurement, a crosscheck with the presence detection sensors can be used to identify a sensor failure.

The system shall deliver a PL_r = c.

4.2.3 Access protection to the chassis via the floor, around wheels and rollers

The chassis shall be provided with appropriate means to prevent any unintentional entrance into the no-trespassing area (for examples of access protection, see Annex C).

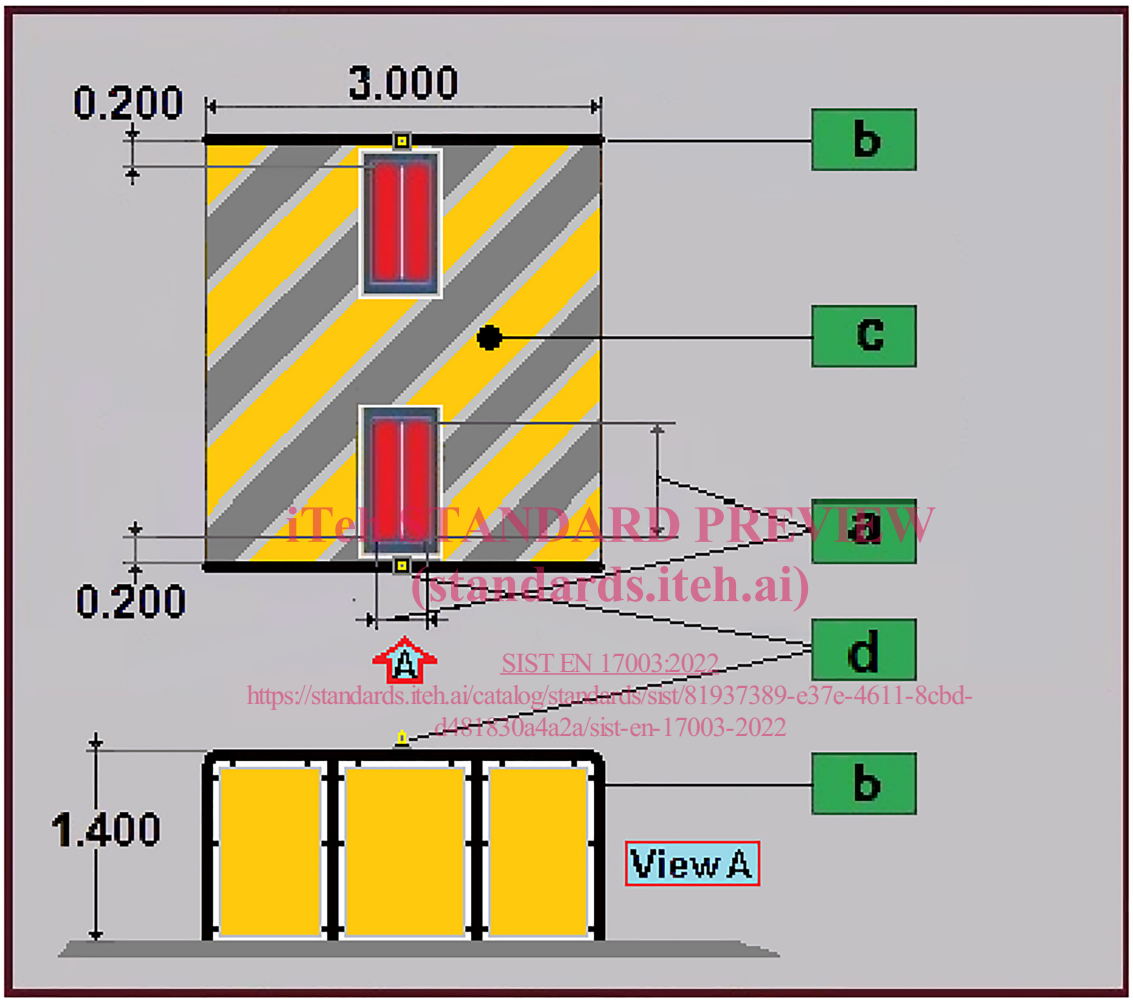
The lateral access to the chassis via the floor, around the wheels and the rollers shall be prevented by barriers.

There shall be an open access way of at least 0,8 m wide between the barriers and the wall or other fixed object. The 2 physical barriers shall be installed on each side of the bench, at a distance of 0,2 m from the

bench. These 2 safeguards shall have a height of 1,40 m and a minimum total length of 3,0 m centred on the mid-axle of the rollers. Such barriers shall have no holes, or holes not larger than 30 mm.

The risk of front and rear access to the chassis shall be managed by (at least) signalling the no-trespassing area using adequate visual elements like designated hazard stripes on the floor, warning lights, or similar (see Figure 1).

The no-trespassing area shall be at least the area delimited by the physical barriers (see Figure 1).



Key

a area of danger identified with the area of the rollers
b physical barriers
c no-trespassing area
d lamp with active yellow flashing linked to the rotation of the rollers

Figure 1 — Surface protection

In the case of an installation to replace a roller brake tester that is installed in an existing installation pit which is located closer than 0,8 m from a wall or other fixed object then the barriers shall be replaced by specific measures (e.g. AOPD, other physical barriers, …) to prevent access to the hazard zone.

4.2.4 Access protection to the chassis from the inspection pit (if it exists)

When the roller brake tester is fitted over an inspection pit or close to an inspection pit, the protection distance before the bench from the axis of the first roller shall be minimum 2,4 m and 5,0 m (see Figure 2) after the bench from the axis of the second roller, to prevent the presence of persons in dangerous areas of the rotating drive shafts, the vehicle wheels, or the brake tester's rollers.

This can be achieved by using:

— Permanently fixed covering, or sliding covering interlocked with the brake tester.

For both of them, it prevents access to the dangerous area. If the sliding covering is motorized, it shall not create additional risk. When the sliding covering is opened, rollers shall not start.

— Protective devices stopping the rotation of the rollers and preventing the rollers from starting.

Refer to Normative Annex B for details.

The design of all auxiliary equipment, like air pressure sensors, should not interfere with the functioning of the protective devices.

The system shall have a PL_r = d according to EN ISO 13849-1:2015 (see Annex D).

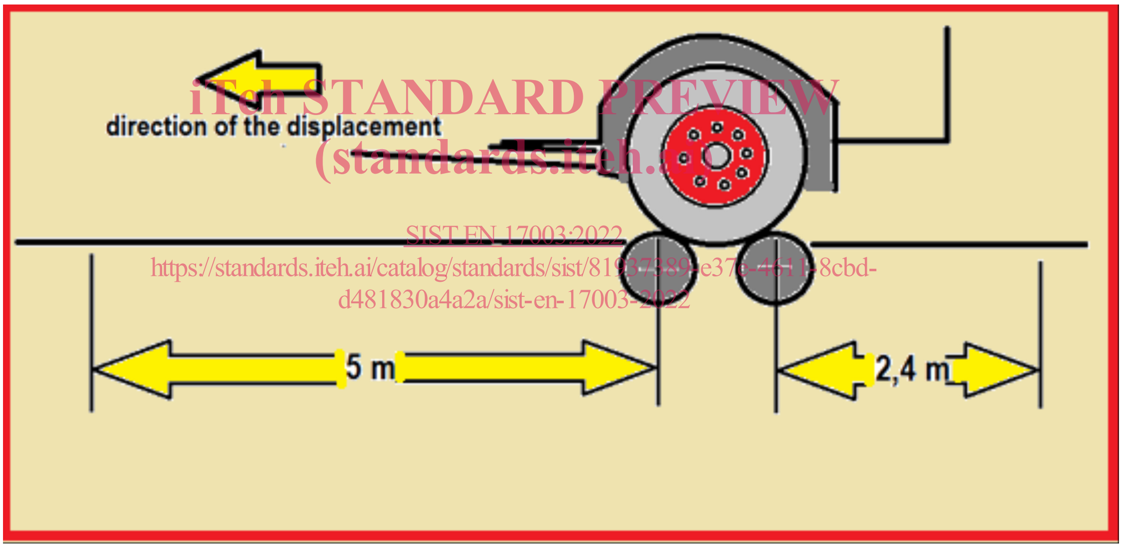


Figure 2 — Protection distance geometry

4.2.5 Protection on access via the vehicle cabin

For the access from the cabin to the hazard zone, without available measures for protection, the risk is residual and shall be underlined and adequately addressed in the user manual.